

1  
2  
3  
4  
5  
6 ENVIRONMENTAL PROTECTION AGENCY

7 PUBLIC HEARING

8 OCTOBER 27, 1999

9 KANSAS CITY CONVENTION CENTER

10 201 WEST 14TH STREET

11 KANSAS CITY, MISSOURI  
12  
13

14 Hearing Officers: Frank Marcinowski - Acting

15 Director, Radiation Protection Division

16 Mary Kruger - Director,

17 Center for Federal Regulations, ORIA

18 Rafaela Ferguson - Radiation

19 Information Center  
20  
21  
22  
23  
24  
25

1                   MR. MARCINOWSKI: Okay. We are  
2 going to get started now. I would like to welcome  
3 you all here this afternoon. This is the  
4 Environmental Protection Agency's public hearing  
5 on our proposed radiation protection standards for  
6 the proposed repository out in Nevada.

7                   My name is Frank Marcinowski. I am the  
8 Acting Director of the Radiation Protection  
9 Division for the Environmental Protection Agency  
10 and I am going to be the Presiding Officer for  
11 today's hearings.

12                  Before we get started, I just wanted to  
13 take a few minutes to, introduce the other  
14 members of our panel, briefly describe our  
15 proposed regulation, and then explain a few ground  
16 rules for the hearings.

17                  The other panel members up here are to my  
18 left, your right, is Mary Kruger, and she is the  
19 Director for the Center for Federal Regulations  
20 within the Radiation Protection Division, and to  
21 my right is Rafaela Ferguson and she is with the  
22 Radiation Information Center within the Radiation  
23 Protection Division.

24                  Just briefly, the background on our  
25 standard. In 1992, Congress gave EPA the

1 important task of setting standards to protect  
2 public health and the environment from harmful  
3 exposure to the radioactive waste that may be  
4 disposed in the proposed underground repository at  
5 Yucca Mountain, Nevada.

6           While EPA will set these standards, the  
7 Nuclear Regulatory Commission has the  
8 responsibility of ensuring that the Department of  
9 Energy can demonstrate that the repository will  
10 meet these standards.

11           Siting a repository at Yucca Mountain  
12 raises many complex, technical, scientific, and  
13 policy issues. For more than five years, we have  
14 conducted extensive information gathering  
15 activities and analyses to understand these  
16 issues. Our goal is to issue standards that are  
17 scientifically sound, that can be reasonably  
18 implemented, and, above all, are protective of  
19 public health and the environment.

20           Our proposed standards address all  
21 environmental pathways: air, water and soil. We  
22 designed proposed standards to protect the closest  
23 residents to the repository to a level of risk  
24 that is within the range we consider acceptable  
25 for all cancer causing pollutants. The closest

1 residents to the repository are currently located  
2 at Lathrop Wells, Nevada. This means that those  
3 further away would be even more protected.

4 In addition, we are proposing to protect  
5 the groundwater resources of Nevada. Because the  
6 proposed repository sits above an important ground-  
7 water aquifer, we are proposing that this valuable  
8 natural resource be protected to the same limit to  
9 which every other source of drinking water in this  
10 country is protected. We want to provide this  
11 protection since the water is currently used for  
12 drinking, irrigation, and dairy cattle. In the  
13 future, this resource could also supply water to  
14 many people in the surrounding areas.

15 This proposed regulation and these  
16 hearings are important milestones in a series of  
17 steps to ensure public involvement in the  
18 decision-making process. We are here to listen to  
19 your views and concerns on the proposal. We are  
20 seeking written comments on the proposed standard  
21 as well, and all written and oral comments  
22 will be carefully considered before we develop  
23 the final standards.

24 In terms of just a few hearing procedures,  
25 we had more formal procedures but since we don't

1 have a great number of people here, what we'll do  
2 is keep it a little more informal. Folks who  
3 wish to speak, I would ask that you confine the  
4 remarks to, you know, no more than ten minutes so  
5 that others who may wish to speak can get up and  
6 get an opportunity as well, and when everybody has  
7 been heard, if those who had already spoken wish  
8 to get up again and have some remarks that they  
9 want to continue with, they can do so at that  
10 time.

11 I just wanted to remind you that the  
12 written comments may be submitted to us no later  
13 than November 26th of this year. Anything you  
14 don't get an opportunity to say here or anything  
15 you wish to say in response to what has been said  
16 may be submitted for consideration. Information  
17 submitted in writing is given the same weight and  
18 importance as oral testimony.

19 A transcript of today's hearing will be  
20 available for review at our docket in Washington  
21 D.C. and at our information files in Amargosa  
22 Valley and Las Vegas, Nevada. In approximately  
23 two to three weeks it will be available.

24 I would like to thank you for taking the  
25 time to attend and testify at today's hearing. At

1 this point, I would like to move on to the first  
2 speaker that's registered, Kay Drey. If you can  
3 come up to the microphone and just spell your last  
4 name for the reporter.

5 MS. DREY: It's K-A-Y, D-R-E-Y.

6 My name is Kay Drey. I live at 515 West  
7 Point Avenue in University City. I am speaking on  
8 behalf of the Missouri Coalition for the  
9 Environment in St. Louis and am a board member of  
10 the Nuclear Information and Resource Service in  
11 Washington D.C. I appreciate the opportunity to  
12 speak here today about your proposed environmental  
13 radiation standards for Yucca Mountain. I did not  
14 get to see the Background Information Document  
15 until today and have not read the National Academy  
16 of Sciences' 1995 report entitled, Technical Bases  
17 for Yucca Mountain Standards.

18 For many years there has been a debate at  
19 abandoned nuclear weapons sites over the question:  
20 How clean is clean? That is: How radioactive --  
21 how dirty can we leave the dirt, the creek  
22 sediments, the groundwater, the bunkers, the  
23 buildings and other debris when today's  
24 generations walk away from their responsibilities  
25 to the generations of the future?

1           And now the EPA is faced with a similar  
2 question: What level of risk is tolerable? How  
3 dangerous can we leave Yucca Mountain as the first  
4 geologic repository for the disposal of irradiated  
5 reactor fuel rods when we walk away from it and  
6 leave it for future generations, for generations  
7 as far into the future as anyone can imagine?

8           As a citizen who has been studying and  
9 working against nuclear power and the generation  
10 of radioactive waste for 25 years, as of next  
11 month, I would like to start by saying I am  
12 opposed to the construction and operation of the  
13 Yucca Mountain facility.

14           I am opposed to shipping the irradiated  
15 fuel rods from over 100 nuclear reactors on the  
16 highways and railways of the United States out to  
17 one location, especially to a seismically-active  
18 site where in the past 20 years there have been  
19 over 600 earthquakes of greater than magnitude 2.5  
20 within a 50 mile radius.

21           I believe this high level, lethally high  
22 level radioactive waste should be kept on site at  
23 the nuclear power plant at which it was generated  
24 until a safe technology has been developed to  
25 neutralize it, to make it not radioactive. That

1 breakthrough may not even happen in the next  
2 millennium, but until then I do not believe these  
3 long-lived toxins should be transported near and  
4 through our towns, and they should not be  
5 stockpiled, above or below the ground, in one  
6 location as the ultimate dream target of  
7 terrorists.

8           I would like to insert two facts here that  
9 I believe help explain the enormity of the hazards  
10 of reactor fuel rods. First, as you know, of  
11 course, radioactivity is measured in curies. The  
12 Washington University Medical Center in St. Louis,  
13 one of the largest in the country, has 1,069  
14 laboratories that use radioactive materials.  
15 Those 1,000 laboratories share two curies of  
16 radioactivity at any one time, two curies total.

17           By comparison, an operating nuclear power  
18 vessel contains some 20 billion curies, and the  
19 irradiated fuel pool contains additional millions  
20 of curies per reactor. To repeat, Washington  
21 University's laboratories use two curies.

22           And the second fact, according to Der  
23 Spiegel, a German news magazine, in its December  
24 22nd, 1997, edition, the estimated amount of  
25 radioactivity that would have to be shipped to the



1 Yucca Mountain parking lot, ultimately to be  
2 placed in the proposed repository, the estimated  
3 amount of radioactivity is the equivalent of 2.3  
4 million atom bombs. 2.3 million atom bombs.

5         Anyone must realize that no rules or  
6 regulations could possibly protect us from such  
7 lethal wastes. We should not pretend that modern  
8 technology can safely transport or isolate wastes  
9 that will continue releasing radioactive particles  
10 and rays for literally hundreds of thousands of  
11 years and beyond. I would like to quote from  
12 Molly Ivin's column last week on nuclear waste.

13         "Don't make any more of this  
14 poisonous stuff until we figure out how to deal  
15 with what we already have." I should  
16 explain that I substituted the word stuff for  
17 Molly Ivin's more damning and appropriate word.

18         I appreciate the EPA's decision to base --  
19 and I'm submitting both the Der Spiegel article  
20 and also Molly Ivin's column. I appreciate the  
21 EPA's decision to base the Yucca Mountain  
22 radiation standards on dose rather than risk. I  
23 would hope that you would consider adding detailed  
24 charts to your proposed standards that would list  
25 the calculated, maximum contaminant levels in air,

1 water and soil permitted for each of the  
2 predominant fission, corrosion, and activation  
3 radionuclides.

4           The charts would translate the maximum  
5 permissible dose into actual amounts in picocuries  
6 per liter or gram of each nuclide as encountered  
7 in the real world. I believe that only through  
8 such charts could the people responsible for  
9 overseeing and assessing the leachates and air  
10 emissions know at what contaminant level they  
11 should call for an evacuation of the public.

12           If a watchman is able to calculate a dose  
13 of millirems or microsieverts from the real-time  
14 readings he gets from a cotton swipe or Geiger  
15 counter, he will need charts, the kind of charts,  
16 for example, of permissible annual average  
17 concentrations per liter of drinking water at the  
18 tap that accompany your 40 CFR 190 -- I didn't get  
19 a chance to check on that national drinking water  
20 regulation. Is it 190? I don't remember.

21                   MR. MARCINOWSKI: Yes.

22                   MS. DREY: I also believe that  
23 publishing such charts of specific radionuclides  
24 at this time as a part of the 40 CFR 197  
25 rulemaking might well generate helpful scientific

1 debate and guidance.

2           Or perhaps people would come to realize  
3 that accurate, protective dose construction is not  
4 really doable. Unfortunately, for most of the  
5 hundreds of reactor fuel isotopes, very few, if  
6 any, animal laboratory health data exist, and  
7 virtually no human data.

8           I would like to submit the abstracts of 16  
9 papers on radioactive hydrogen -- tritium -- to  
10 demonstrate the degree of controversy that exists  
11 about just one isotope and its biological  
12 effectiveness. That is, the harm tritium can  
13 cause to plants and animals, such as to their DNA  
14 and reproductive systems. The radiotoxicity  
15 rankings of most fission and activation products  
16 are unfortunately more conjecture than science.

17           I question the National Academy of  
18 Sciences' conclusion that developing a fatal  
19 cancer represents the greatest harm an individual  
20 can receive from low-dose-rate radiation.

21           Back in 1978, I interviewed about 40  
22 atomic veterans at a conference in Washington  
23 D.C., admittedly a tiny database, and found many  
24 of them shared a wide range of similar, serious  
25 health effects, such as: premature muscular

1 deterioration, neurological, reproductive,  
2 immune, circulatory, and endocrine system  
3 disorders. A number of them had children with  
4 health defects evident at birth or later. Those  
5 serious illnesses were in addition to the cancers  
6 the atomic veterans experienced, and are  
7 experiencing I should say.

8 I hope the EPA will have the opportunity  
9 to question the effectiveness of borosilicate  
10 glass; that is, the Nuclear Regulatory  
11 Commission's reliance on vitrification as a  
12 technology to solidify high level radioactive  
13 waste sludges and liquids.

14 I remember the controversy in 1978 and '79  
15 over a report prepared by the National Academy of  
16 Sciences' waste solidification panel. The report  
17 was then withheld. The report questioned the  
18 DOE's choice of glassification. I have other  
19 reports that describe how radiation can quite  
20 rapidly cause glass to crack.

21 With regard to the EPA's choice of a  
22 10,000 year compliance period, this was apparently  
23 based, in part, on the assumption that generic  
24 sites could be chosen that would assure long  
25 groundwater travel times, that is, for at least the

1 thousand years that it would take for the water to  
2 migrate.

3           This kind of prediction reminds me of the  
4 Department of Energy's forced admission, within  
5 the past few years, that the radioactive  
6 groundwater plumes in Hanford, Washington that  
7 experts had predicted would remain isolated for  
8 millennia had instead already penetrated through  
9 the unsaturated vadose zone, the water table, and  
10 the phreatic area in their migration path toward  
11 the Columbia River, all within just 50 years or  
12 less.

13           I believe we should shut our nuclear power  
14 plants down now and store the irradiated fuel rods  
15 in casks inside the reactor containment building  
16 or other safety-related structures until someone  
17 sometime figures out how to make the radioactive  
18 wastes not radioactive, and until we know what to  
19 do with the waste we already have, we should and  
20 must stop generating more.

21           Finally, I hope the EPA will not promise  
22 the American people that the wastes proposed for  
23 Yucca Mountain could remain safely isolated there  
24 for even a hundred years let alone for the  
25 requisite millennia. Thank you.

1 MR. MARCINOWSKI: Thank you,  
2 Ms. Drey. If you have materials you plan on  
3 submitting --

4 MS. DREY: I brought two copies.

5 MR. MARCINOWSKI: Okay. Thank you  
6 very much.

7 MS. DREY: Do you have any  
8 questions?

9 MR. MARCINOWSKI: Not at this time.  
10 Right now we currently don't have anyone else  
11 signed up on the roster of testifiers. Is anyone  
12 else in the audience interested in getting up and  
13 testifying? Okay.

14 MS. DREY: I am prepared to speak  
15 until nine.

16 MR. MARCINOWSKI: Well, if you  
17 want --

18 MS. DREY: Start again?

19 MR. MARCINOWSKI: If you have more  
20 remarks, you are perfectly welcome to get up now.

21 MS. DREY: Maybe somebody else  
22 will.

23 MR. MARCINOWSKI: I think they  
24 indicated they were not going to right now. It's  
25 up to you.

1 MS. KRUGER: Can I ask a question?  
2 You said you favored dose over risk. Could you  
3 just elaborate on that a little more?

4 MS. DREY: Yeah. Do you want me to  
5 go over there?

6 MS. KRUGER: Sure.

7 MS. DREY: I have no faith in risk  
8 or risk communication or risk analysis or  
9 anything. I think risk is a bogus concept.  
10 I speak every year at St. Louis University  
11 Medical School to a class on risk communication.  
12 I'm sort of their token whatever, and I think --  
13 so I just don't -- I think it is so unscientific  
14 and I think mostly covers up what's really  
15 happening. It just gives us another layer of kind  
16 of funny numbers to deal with and to obviate, I  
17 think, what's happening, but I have to say I don't  
18 have any much faith in dose assessments either.

19 Like millirems and microsieverts -- I  
20 particularly have been annoyed from the beginning  
21 when they started using international numbers that  
22 just cut everything in half -- you know, by a  
23 hundred and [inaudible] a hundred whenever you  
24 have one, and so everything sounds less damaging,  
25 and I think that's intentionally misleading but

1 even with the millirems -- and I am sorry I didn't  
2 -- I have an absolute houseful of documents and we  
3 have two beds and documents is what our house  
4 consists of, but I would like to have brought a  
5 statement that was made by somebody, probably in  
6 1947 or so. You know something? I actually did  
7 bring it. Excuse me. It may take a while. I  
8 have everything filed, which means I will never  
9 find it.

10 MR. MARCINOWSKI: If you would like  
11 to take a break for a few minutes and then  
12 whenever you are ready just let us know, that will  
13 be fine.

14 MS. DREY: I am very sorry.

15 MR. MARCINOWSKI: That's all right.  
16 Take your time.

17 MS. DREY: I am almost positive I  
18 brought a copy. Well, maybe I didn't bring it. I  
19 can send it to you.

20 MR. MARCINOWSKI: That will be  
21 fine.

22 MS. DREY: What I was referring to  
23 was a statement, and maybe it was from the 1950s,  
24 by one of the people with, I think the Atomic  
25 Energy Commission, who said that they really



1 decided what the permissible doses were,  
2 permissible maximum contaminant levels, on the  
3 basis, just as I said, of very few animal data and  
4 virtually no human data, and we have -- we don't  
5 have, fortunately because we are not supposed to  
6 believe in human experimentation, we don't have a  
7 lot more human data than we did other than for  
8 plutonium and some other things, and so I have --

9           I have been fighting nuclear power and  
10 studying radioactive waste issues for 25 years,  
11 and almost from the beginning I began asking the  
12 Nuclear Regulatory Commission, Would you please  
13 tell me -- you know, I would see that there was a  
14 spill from a truck and I would say, Would you  
15 please tell me how many curies this is that  
16 spilled because you are saying it's X number of  
17 millirems? How many curies is what I want to  
18 know?

19           There is a lot of uncertainty in dose -- there is  
20 a lot of make-believe or make up. It's not an  
21 exact science either. If you look at, say, the  
22 Code of Federal Regulations 10 CFR 20 --  
23 Appendix B, the radiation standards for  
24 the NRC -- you see hundreds of different isotopes  
25 and then each one is divided by permissible in

1 water versus air for workers versus a member of  
2 the public, but also soluble versus insoluble as  
3 -- and as if -- I was just looking up a particular  
4 cesium isotope just a couple days ago, and there  
5 is this huge difference between two cesium  
6 isotopes, what is permissible, and I don't believe  
7 they have any knowledge that one isotope is more  
8 of a -- emits more of -- creates more of a  
9 radiation hazard than another.

10           It is make-believe, so I'm not really  
11 happy with millirems either. In fact, when I've  
12 worked with citizens all over the country, I've  
13 always said to them, please ask for what the  
14 readings are in picocuries per gram if it's soil  
15 or per liter if it's water, and that doesn't tell  
16 you everything but they really don't know the  
17 difference between, you know -- they say cesium,  
18 let's say, and strontium are worse than other  
19 things.

20           I mean, for instance, you all are looking  
21 at carbon 14 as one of the potential emission --  
22 as one of the isotopes that might get out of the  
23 Yucca Mountain facility, but there are noble gases  
24 as well that don't maybe have as long a half life.  
25 Krypton 85 has a half life of ten plus years. So

1 it means it will be around for a hundred years or  
2 so, but I think the kryptons -- krypton breaks  
3 down into strontium and xenon breaks down into  
4 cesium, and these are both materials that we know  
5 are very radiotoxic.

6           They are very radioactively toxic so --  
7 but I just don't think we -- I don't think we know  
8 enough even to give good dose assessments let  
9 alone figure out what the risk is, and you know  
10 what else about risk that really annoys me -- I sort  
11 of said something earlier -- is that it's the risk  
12 of cancer as if all that we've been learning  
13 about, and I gave a litany of them, the endocrine  
14 system, the immune system, and reproductive  
15 system, the circulatory system, I don't know if  
16 muscles are in a system or not, but I was struck  
17 when I -- I mean, I am -- since I can speak until  
18 nine o'clock, I will just ramble, but I was struck  
19 when I was in Washington and spoke with those 40  
20 -- about 40 atomic veterans that one of -- I met  
21 some of them for breakfast and I took copious  
22 notes when I was speaking with them, not for any  
23 purpose but that's just the way I function, and  
24 two of them got into a conversation. This was  
25 breakfast.

1           One of them was holding his pen and he  
2 kept kind of moving his hands or something and  
3 another veteran who was sitting there said, "What's  
4 the matter with your hand?" And the guy said,  
5 "Well, I just" -- and these were young -- relatively  
6 young people. It turned out they have the same  
7 kind of muscular deterioration that no one had  
8 ever asked them about and no one had ever thought  
9 maybe was due to their exposure of radiation.

10           That's a long answer. I am really sure I  
11 brought my thing with me but it's lost for the  
12 moment. I mean, I'm sorry. I don't like dose,  
13 and, in fact, I was one of the people here in  
14 St. Louis who was asked to speak to a group of  
15 experts about risk about three years ago or  
16 something. One of them was a Nobel Laureate, and  
17 I can send you that if you are interested. It's a  
18 whole big bunch of pages about why I don't like  
19 risk assessment. I just think it's bogus. I'm  
20 sorry.

21                   MR. MARCINOWSKI: Thank you again.

22                   MS. DREY: I have more to say.

23                   MR. MARCINOWSKI: Go ahead. The  
24 floor is yours.

25                   MS. DREY: This is a postscript and

1 I wrote it -- just the start of it. Among the  
2 most incredible documents I have in my large  
3 nuclear power and radioactive waste library is a  
4 set of technical reports from the 1980s about the  
5 need to meet the challenge of warning human beings  
6 of the infinite -- human beings of the infinite  
7 future to avoid the lethal nuclear electricity  
8 waste we are leaving for them.

9           The titles of these reports prepared by  
10 the Survey Research Center of the University of  
11 California, Berkeley, for Batelle, Ohio, for the  
12 Department of Energy include -- and I just wish  
13 you would listen to these titles. The titles  
14 alone are incredible but the reports themselves  
15 are mind boggling: "Building on Existing  
16 Institutions to Perpetuate Knowledge of Waste  
17 Repositories." That's not very interesting, but  
18 "Communication Across 300 Generations: Detering  
19 Human Interference with Waste Deposit Sites," and I  
20 know you talk a lot about the human intrusion  
21 problem, potential problem: "Communication  
22 Measures to Bridge Ten Millennia."

23           So how do you get the message across?  
24 "Reducing the Likelihood of Future Human Activities  
25 That Could Affect Geologic High-level Waste

1 Repositories."

2           Those are four different reports. Another  
3 report in the same era and with the same goal is  
4 entitled, "Archaeological Data as a Basis for  
5 Repository Marker Design," published by The  
6 Analytic Sciences Corporation of Reading,  
7 Massachusetts.

8           These reports, all of them, would truly  
9 qualify as textbooks for stand-up comics if they  
10 weren't so serious and I guess so inherently  
11 absurd, but that remains one of the basic,  
12 unanswerable questions of this whole radioactive  
13 waste mess. How can we keep 300 generations of  
14 our descendants away from these lethal wastes? Is  
15 it even remotely possible?

16           You know, when you think of trying to talk  
17 to people 300 generations from now and one of  
18 these -- I brought some pages from some of these  
19 reports along. Unfortunately, I don't have them  
20 copied but I could send them to you if you wanted  
21 me to.

22                   MR. MARCINOWSKI: That will be  
23 fine.

24                   MS. DREY: But one of them, the one  
25 by the -- the archaeologist, archaeological data

1 and she looks at all -- she looks at a lot of  
2 different human creations like the Great Wall, the  
3 Great Wall of China and so on that have lasted  
4 a long time. I mean not, you know, 10,000 years  
5 or a million but -- and then she came up with a  
6 monolith that had -- it had a little drawing that  
7 I looked at for several years before I realized  
8 what it was, and it was a little cartoon figure  
9 with a shovel and then a slash like, you know,  
10 don't turn left here, you know, as if they are  
11 going to know what that is in 300 generations from  
12 now.

13 I mean, I couldn't even figure out it was  
14 a shovel but I'm not very mechanical and then --  
15 but she decided that drawing would be at the top  
16 of this tall monolith which would be placed on top  
17 of some radioactive waste dump, and then she said  
18 that she chose the four official languages of the  
19 United Nations to say something like, "Don't dig  
20 here." Now, those are currently the four official  
21 languages of the United Nations assuming it lasts  
22 for another hundred years or something.

23 I mean, but then she also had a drawing  
24 that was four drawings, you know, four drawings  
25 that showed somebody digging somewhere. There

1 were little people. Somebody I talked to a couple  
2 days ago thought they were cows but they were  
3 supposed to be people, and they got into this  
4 buried toxic waste or radioactive waste but there  
5 were four like cartoon drawings and at the bottom  
6 there were people dead.

7           You know, they are cartoon drawings, and I  
8 showed -- you know, I showed that to people and I  
9 thought that's a pretty good way of trying to  
10 communicate over the millennia but one of the  
11 people I showed it to started at the bottom and  
12 went up.

13                   MR. MARCINOWSKI: Thank you.

14                   MS. DREY: You want me to talk  
15 about four millirems and 15 millirems?

16                   MR. MARCINOWSKI: Let me just check  
17 one more time to make sure no one else in the  
18 audience is interested in testifying at this time,  
19 and I don't believe so. So please continue.

20                   MS. DREY: This is terrible. You  
21 should never encourage me. I just wanted to say  
22 that I don't think millirems are very  
23 provable or I think you really -- I think they  
24 have a lot of guesswork in them when they are  
25 looking at particular radioisotopes and deciding



1 how relative -- their relative biological  
2 effectiveness.

3 I think there is just huge bunches of  
4 guesswork, but if you are going to have to deal  
5 with millirems, and I guess you all have to -- I  
6 do want to say that I support your four millirem  
7 proposed dose for water leaving the site.

8 I think if any water can leave the site,  
9 Yucca Mountain shouldn't be the site, but -- and I  
10 think four is, you know, higher than I wish and I  
11 can just -- to return to tritium which happens to  
12 be my favorite radioisotope, radioactive hydrogen,  
13 just to show you about how I think irresponsible  
14 the concept of millirem can be. The Nuclear  
15 Regulatory Commission allows something like a  
16 million or two million, it's hard to understand,  
17 picocuries per liter of tritium to be released in  
18 the environment.

19 In nature, in streams, it's ten, and they  
20 allow, as I said, a million or two million, and I  
21 am a little confused, maybe even three million,  
22 but based on what the NRC used to allow, which was  
23 three million picocuries per liter, the EPA  
24 extrapolated down from what was a 500 millirem  
25 permissible dose to a four millirem permissible

1 dose at the tap and you all allow 20,000  
2 picocuries per liter of tritium and in drinking  
3 water at the tap, and when you compare that amount  
4 -- did I say 10,000? 20,000? I mean, sometimes I  
5 can't remember these numbers because they are so  
6 outrageous. When you compare 20,000 permissible  
7 and define that or translate that as four  
8 millirems, 20,000; whereas, in nature it's ten,  
9 that's a lot more that you are allowing us to  
10 drink.

11           When I first heard about tritium in 1977,  
12 I called a health physicist from Oak Ridge to ask  
13 about tritium and I said, "Could you please tell me  
14 about tritium?" and he said, "tritium is no big deal."  
15 This was in 1977. "All it can do is destroy a DNA  
16 molecule." And I said, "Well, I don't really want my  
17 DNA molecules destroyed or my children's DNA  
18 molecules destroyed." And it has a half life of  
19 twelve years, and so I think for the EPA to let us  
20 drink 20,000 picocuries per liter and maybe  
21 drinking two liters per day I think that's a bunch  
22 and so -- and I'm not criticizing the EPA. You  
23 all just took the NRC's tables and, you know,  
24 extrapolated down from 500 to four millirems.  
25 That's what happened. If you do the math, that's

1 right. It took me a long time but it works.

2 Doesn't it?

3 MR. MARCINOWSKI: I mean --

4 MS. DREY: If you allow -- if the  
5 NRC at the time was allowing three million  
6 picocuries per liter were dumped into the river  
7 and they translated that as 500 millirems which at  
8 the time was about five times background. So  
9 that's the way it was and what I'm trying to say  
10 is millirems are not a real science and risk is  
11 even worse.

12 MR. MARCINOWSKI: Thank you.

13 MS. DREY: I like your four, okay,  
14 in water, and I like your 15 better than I like  
15 the NRC's 25 for all pathways. I think 15 is too  
16 high and I don't know how you are going to, again,  
17 without seeing a chart and what you are going to  
18 call tritium and what you are going to call -- but  
19 I certainly would hope that you will stay firm in  
20 your 15. Thank you.

21 MR. MARCINOWSKI: Thank you. As I  
22 said, we don't have any more testifiers currently  
23 listed on our roster right now, and no one from  
24 the audience at this point in time is -- wants to  
25 get up and speak; is that correct? Okay. Given

1 that, I think we will recess until somebody else  
2 shows up to -- who wants to speak or somebody here  
3 wishes to talk again.

4 MS. BLAKLEY: I would like to make  
5 a statement and some questions along with that or  
6 do I need to sign up?

7 MR. MARCINOWSKI: You don't need to  
8 sign up. You have a statement?

9 MS. BLAKLEY: Yes.

10 MR. MARCINOWSKI: Sure. Please  
11 state your name and spell your last name for the  
12 record.

13 MS. BLAKLEY: My name is Melissa  
14 Blakley, B-L-A-K-L-E-Y. Do you need an address or  
15 anything?

16 I would like to address the issue of the  
17 transportation of these radioactive wastes through  
18 Kansas City and other parts of the nation since we  
19 are, in fact, in Kansas City today.

20 I notice on the map of routes that a large  
21 percentage of the routes go right through our  
22 city. So my first question is, how often are we  
23 going to be exposed to these dangers? Actually,  
24 it looks like it could be as much as 50 percent of  
25 the routes come right through Kansas City. We are

1 looking at increased trucking traffic already on  
2 our national highways, and I am already concerned  
3 about being on the highways with trucks and the  
4 number of accidents that are occurring.

5           How safe can this -- these materials be,  
6 and from what we just heard from Ms. Drey, not  
7 very. The acceptable risk that industry and  
8 others are considering isn't acceptable to me, and  
9 I would suggest that it's not going to be  
10 acceptable to those of us in Kansas City either if  
11 we are aware of what's happening right through our  
12 city, day in and day out.

13           Would you have some number of how often,  
14 how many times a day Kansas City would be exposed  
15 to these radioactive wastes? Not exposed but the  
16 potential of exposure?

17           MR. MARCINOWSKI: I understand.  
18 Yeah. Unfortunately, I don't have the number or  
19 the EPA is not responsible for that part of this  
20 effort. Just to give a brief overview of the  
21 responsibilities. Our job is to set the  
22 standard for the waste that would be disposed of  
23 at the repository in Nevada. DOE operates and  
24 runs that facility and they currently have an  
25 environmental impact statement that addresses

1 transportation issues. That's currently out for  
2 review and I know they've got a number of -- 12 to  
3 15 public hearings across the country that they  
4 are currently in the process of having, and that  
5 environmental impact statement does address the  
6 transportation issues and the transportation  
7 routes, and also the Department of Transportation  
8 is, you know, involved in establishing those  
9 routes, and we do have a pamphlet in the back that  
10 talks about the various roles of federal agencies  
11 and lists contacts, I believe, for those  
12 agencies. So we could certainly get you in  
13 touch with the right people who would have that  
14 information.

15 MS. BLAKLEY: I think it's curious  
16 that we are looking at a site to put these wastes  
17 in when we haven't even figured out how we are  
18 going to get the waste there, and the first thing  
19 that comes to my mind is terrorism. We are  
20 concerned about domestic terrorism and terrorism  
21 from around the world, and how protected can a  
22 truck of radioactive waste be? Is it going to be  
23 -- are they going to be transported with Army  
24 escorts, military escorts, or are they going to be  
25 running through town where nobody really knows

1 what's going on? Unfortunately, with the record  
2 of our government, I would say the latter is  
3 probably what would be happening. So as a Kansas  
4 Citian, as a citizen, in general, of the country, I  
5 would be very concerned about that going on and I  
6 would have to support Ms. Drey in her suggestion  
7 that none of this stuff should be moved, especially  
8 through our cities and through populated areas  
9 along our interstate highways. Thank you.

10 MR. MARCINOWSKI: All right. Thank  
11 you, Ms. Blakley. Yes, Ms. Drey.

12 MS. DREY: Two people, Melissa was  
13 one of them, accused me that I would be a filibuster,  
14 but I don't think you can filibuster if there is  
15 no one. I didn't bring a lot but I brought one of  
16 my favorite documents on this topic, which happens  
17 to be an EPA document, that I would really urge  
18 you to look at. It's called, "State of Geological  
19 Knowledge Regarding Potential Transport of High  
20 Level Radioactivity Waste From Deep Continental  
21 Repositories." In other words, after it's in the  
22 repository, about the transport. It's a report of  
23 an ad hoc panel of earth scientists. They had a  
24 geology -- and it's from 1978. I can give you the  
25 document number. Do you want me to read it out

1 right now? It's EPA/520/4-78-004. These are  
2 geologists -- the head of the geology department  
3 from Harvard, Brown, Texas A & M, Dartmouth and  
4 Princeton, and this was back in '78.

5 I don't think a document like this could  
6 get printed today, but it is full of their  
7 unknowns about what these top geologists said  
8 about how much is unknown if we dump this or  
9 put this stuff in a deep geologic repository  
10 what's going to happen to it. It is just a  
11 remarkable document. Maybe I can just read a  
12 couple.

13 "The objective of the transport modeling,  
14 you know, computer modeling, considered in this  
15 analysis is to forecast the subsurface movement  
16 and evolution of radionuclides emanating from a  
17 radioactive waste repository under various  
18 hypothetical situations. Perhaps the most  
19 challenging aspect of this problem is the  
20 necessity to forecast over long time periods,  
21 250,000 years with uncertain information."

22 In here too they sort of talk about how  
23 geologists are trained to look sort of backwards  
24 and be knowledgeable about what used to happen,  
25 not about what's apt to happen in the future.



1           "The introduction of a repository into a  
2 geologic unit poses a number of mechanical  
3 requirements on the rock. The need for sufficient  
4 strength to allow safe excavation and occupancy  
5 until the repository has been sealed; mechanical  
6 integrity despite the subsequent high  
7 temperatures; low permeability; and absence of  
8 discontinuities like jointing and bedding; are a  
9 very small number of these. Knowledge of  
10 mechanical properties for the various candidate  
11 lithologies varies considerably, and some  
12 uncertainties remain for all rock types," and then  
13 they talk in here about the National Academy of  
14 Sciences draft report on rock mechanic  
15 limitations.

16           And they just feel in here -- they are  
17 saying that there is just so much that isn't  
18 known. Just one other quote. It's a very strong  
19 statement. "It seems clear that the uncertainties  
20 of forecasting the behaviors of conceptual --  
21 conceptual high level waste repositories are due  
22 principally to inadequate knowledge of the  
23 relevant, mechanical, radiochemical, and  
24 hydrologic properties of the candidate rock types.  
25 Most of these can be measured by well-established

1 methods, but times required even for adequately  
2 funded research efforts are likely to vary widely,  
3 from a year or so to a decade or more."

4           As noted in the text, "there are also  
5 several questions, notably the determination of  
6 real permeabilities and porosities in the rocks at  
7 a site, or the nature of the long-term monitoring  
8 systems, answers to which must await the invention  
9 of new technology. The time scale for such  
10 research is much less readily determined."

11           It is just full of saying we don't really  
12 know what's going to happen if you put  
13 radioactively hot and thermally hot materials in  
14 the -- in a deep geologic repository.

15           I found my thing that I was looking for,  
16 and this is a quote, appearing before the Joint  
17 Committee on Atomic Emergency for the U.S.  
18 Congress. In May 1960, W. B. Harris, Director of  
19 the Environmental Science Division of the Atomic  
20 Energy Commission's Health and Safety Laboratory  
21 testified as follows, "If one now refers  
22 to handbook number 60 which would be the radiation  
23 council handbook here can be seen a list of  
24 approximately 25 numbers for each of about 200  
25 radionuclides. How is it possible that one can

1 derive approximately 50,000 different permissible  
2 concentrations, and," by the way, it's much more  
3 than that today, "cloak these values with legal  
4 stature when they have been generated on the basis  
5 of the relatively few human injuries which have  
6 been documented is beyond comprehension. It is  
7 true that considerable animal experiments has gone  
8 into the development of many of these data.  
9 However, one must only cautiously take the  
10 position that man as an animal is to be ignored.  
11 Human experience is surely the more valuable," and  
12 he is talking about 200 radionuclides and I think  
13 we now have 300 something, and these charts and  
14 there are potentially 1,400 that they can mess  
15 around with, but -- do you want these long -- this  
16 is -- I pay people a quarter if they read through  
17 something I've written without falling asleep. I  
18 have had to pay three quarters in 25 years, but  
19 this is -- this was testimony I gave in Washington  
20 in 1980, a hearing by the Committee on Federal  
21 Research on Biological Effects of Ion Radiation  
22 and it was held at the National Academy of  
23 Sciences and I think there were three people who  
24 testified that day. I was one of them but I  
25 didn't misbehave the way I am today. Would you be

1 interested in this?

2 MS. KRUGER: Yes.

3 MS. DREY: You have to read them  
4 standing up. It's not infallible but it would  
5 help.

6 MR. MARCINOWSKI: Is anyone else  
7 wishing to testify at this point? Okay. Then  
8 let's take a recess until we get other people who  
9 show up or are willing to testify. Thank you.

10 (Whereupon, the last testimony  
11 ended at 1 p.m. At 4:30 p.m. the hearing was  
12 recessed for dinner and resumed the hearing at  
13 6 p.m.)

14 MR. MARCINOWSKI: Let the record  
15 show that we have been here since about one  
16 without a single person coming to testify. It is  
17 now approaching 7:30 and we're going to close  
18 these hearings for today.

19

20

21

22

23

24

25

## 1 CERTIFICATE

2  
3 I, Alison K. McTague and Glenda Moeller,  
4 Certified Shorthand Reporters, do hereby certify  
5 that we appeared at the time and place first  
6 hereinbefore set forth, that I took down in  
7 shorthand the entire proceedings had at said time  
8 and place, and that the foregoing constitutes a  
9 true, correct, and complete transcript of my said  
10 shorthand notes.

11  
12  
13 \_\_\_\_\_  
14 Alison K. McTague, CSR, RMR

15  
16 \_\_\_\_\_  
17 Glenda Moeller, CSR, RMR  
18  
19  
20  
21  
22  
23  
24  
25